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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,337	04/17/2001	Xiaodong Li	005158.P004X	8573

7590 05/07/2004
Michael J. Mallie
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1026

EXAMINER

ZEWDU, MELESS NMN

ART UNIT	PAPER NUMBER
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2683

14

DATE MAILED: 05/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/837,337

Applicant(s)

LI ET AL.

Examiner

Meless N Zewdu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 25-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12, 16 and 23 is/are rejected.
- 7) ☒ Claim(s) 6, 13-15, 17-22 and 24 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6, 10-13</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. This action is the first on the merit of the instant application.
2. Claims 25-31 are withdrawn from further consideration as a result of Election/Restriction requirement (see below).
3. Claims 1-24 are pending in this action.

Specification

This application appears to be a division of Application No. 09/738,086, filed 12/15/2000. A later application for a distinct or independent invention, carved out of a pending application and disclosing and claiming only subject matter disclosed in an earlier or parent application is known as a divisional application or "division." The divisional application should set forth only that portion of the earlier disclosure which is germane to the invention as claimed in the divisional application. Appropriate correction is required.

Claim Objections

Claims 1 is objected to because of the following informalities: the claim recites "selected by the sub-carrier for use in communication with the subscriber" (see claim 1, line 8). The sub-carrier is to be selected, but, not a selector. For examination purpose, examiner considers it as a typographical error and interpret it as --- selected by the subscriber ---. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 recites the limitation "selected by the subscriber" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the SINR values" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-24, drawn to frequency reuse scheme or carrier partitioning, classified in class 455, subclass 447.
- II. Claims 25-29, drawn to channel allocation in a hierarchically sectorized cell structure, classified in class 455, subclass 450.
- III. Claims 30-31, drawn to clustered channel allocation based on priorities, classified in class 455, subclass 512.

The inventions are distinct, each from the other because of the following reasons:

Inventions, frequency reuse scheme, channel allocation in a hierarchically sectorized cell structured, and clustered channel allocation based on priorities are related as combination and subcombination. Inventions in this relationship are distinct if it can

be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the frequency reuse scheme does not require a hierarchical cell structure or a priority scheme. On the other hand, channel allocation either does not require a priority scheme or that the cell structure be hierarchical. The subcombination has separate utility such as the use of frequency reuse for non-overlapping (non-sectored) cellular structure, and without assigning priority.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Groups I and/or III, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mallie, Michael J. (# 36,591) on 4/23/04 a provisional election was made with traverse to prosecute the invention of group I, claims 1-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 25-31 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini et al. (Cimini) (US 5,914,933).

As per claim 1: a method for sub-carrier selection for a system employing orthogonal frequency division multiple access (OFDMA) comprising:

partitioning sub-carriers into a plurality of groups of at least one cluster of sub-carriers reads on '933 (see abstract; col. 3, lines 26-43; col. 4, lines 41-56). OFDM is a technique of partitioning a carrier into groups of sub-carriers.

receiving an indication of a selection by the subscriber of one or more groups in the plurality of groups reads on '933 (see col. 1, line 47-col. 2, line 16).

allocating at least one cluster in the one or more groups of clusters selected by the sub-carrier for use in communication with the subscriber reads on '933 (see fig. 1A; col. 2, line 63-col. 3, line 17; col. 4, lines 41-56; col. 12, lines 8-23). The prior art's OFDM system includes transmitter (for allocation sub-carriers) and receiver (for receiving the allocated subcarriers). But, Cimini does not explicitly teach about the OFDM channels being used for multiple access, hence becoming OFDMA, as claimed by applicant. However, in a related field of endeavor, Hakkinen teaches spread coding

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of a transmission signal according to CDMA method and signal modulation by subcarriers according to the OFDMA method preferably combined and the signals are then demodulated and multiuser detected in a receiver (see col. 1, line 60-col. 2, line 57; col. 4, lines 30-64; col. 5, lines 4-23). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the teaching of Cimini with the teaching of Hakkinen for the advantage of having reception signals grouped so as to detect only some of them (see col. 4, lines 57-59).

As per claim 2: the method further comprising the subscriber sending the indication to a base station reads on '933 (see col. 2, lines 1-11; col. 4, lines 41-50).

As per claim 3: the method further comprising sending an indication of the group of clusters selected by the base station for use by the subscriber reads on '933 (see col. 1, lines 46-60; col. 2, lines 12-19; col. 8, lines 31-46; col. 13, lines 7-20).

As per claim 4: the method wherein clusters in each of the plurality of groups of clusters are spaced apart over bandwidth allocatable by the base station reads on '933 (see col. 2, lines 12-17).

As per claim 5: the method wherein clusters in each of the plurality of groups are spaced apart farther than coherent bandwidth of each channel between the base station and the subscriber reads on '933 (see col. 10, line 66-col. 11, line 46). The partitioning of a frequency spectrum into subcarriers using guard intervals will place the each cluster further than the coherent bandwidth.

As per claim 7: the method defined in Claim 1 wherein the one or more groups is only a subset of all of the groups of clusters allocatable by a base station reads on '933 (see abstract; col. 1, line 47-col. 2, line 16). The transmitter in the prior art is a base station.

As per claim 8: the method further comprising:

sending a pilot signal to the subscriber reads on '933 (see col. 4, lines 41-50; col. 7, line 65-col. 8, line 5).

As per claim 9: the method wherein the pilot signal indicates availability of each cluster reads on '933 (see col. 4, lines 41-50). The receiver sends a feedback signal to the transmitter to let the transmitter know if there is a matching strength channel is available.

Claims 10-12 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini in view of Hakkinen as applied to claim 1 above, and further in view of Rashid-Farrokhii et al. (hereinafter Farrokhi) (EP 0 999 658 A2).

As per claim 10: the method further comprising receiving feedback information on the one or more groups of clusters of subcarriers from the subscriber reads on '933 (see col. 4, lines 41-50). But, Cimini in view of Hakkinen do not explicitly teach about a feedback information that comprises SINR information for at least one cluster in each of the one or more groups, as claimed by applicant. However, in a related field of endeavor, Farrokhi teaches about an OFDM technique wherein a mobile station estimates the quality of received subcarriers and sends a feedback signal to its base station including SINR values (see col. 6, line 49-col. 7, line 3; col. 8, line 18-col. 9, line 53). Therefore, it would have been obvious for one of ordinary skill in the art at the time

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the invention was made to further modify the above references with the teaching of Farrokhi for the advantage of enabling the base station to substantially and simultaneously control transmit power to mobile terminals (see col. 1, lines 39-57).

As per claim 11: claim 11 recites that the subscriber has a fixed association with the at least one group of clusters, such that group identifier information to identify groups associated with the SINR information is not necessary which reads on '933 (see col. 2, lines 1-11). The '933 prior art does not have group identifiers. Furthermore, not assigning group identifiers with the absence of groups would have been obvious for one of ordinary skill in the art. In fact, the claim does not show an active role by the subscriber to prevent the identifier. It simply says, there is only one group of clusters and therefore no need to have group identifiers which is obvious.

As per claim 12: the feature of claim 12 is similar to the feature of claim 10 and is rejected on the same ground and motivation as claim 1. Note: since claim 12, as mentioned above has a problem associated with lack of antecedent basis, is vague and indefinite. For examination purpose, the claimed feature is interpreted as the feedback information has the SINR value included therein.

As per claim 23: the method defined in Claim 1 further comprising receiving feedback information on the one or more groups of clusters of sub-carriers from the subscriber, and wherein the subscriber is associated with at least one group of clusters and, further wherein the feedback information includes an SINIR. value associated with each group of clusters without explicitly specifying an index to the group of clusters reads on '933 reads on '933 (see col. 2, lines 1-11). The '933 prior art does not have group identifiers.

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Furthermore, not assigning group identifiers/indexes with the absence of groups to be indexed would have been obvious for one of ordinary skill in the art. In fact, the claim does not show an active role by the subscriber to prevent the identifier. It simply says, there is only one group of clusters and therefore no need to have group identifiers which is obvious.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini in view of Farrokhi as applied to claim 1 above, and further in view of Martinez et al. (Martinx) (US 6,009,553).

As per claim 16: but, Cimini in view of Farrokhi do not explicitly teach the method of receiving feedback information on the one or more groups of clusters of subcarriers from the subscriber, and wherein the feedback information is protected using error correcting codes, as claimed by applicant. However, in a related field of endeavor, Martinx teach an adaptive error correction technique for communications link wherein a mobile station encodes a message using error correction algorithm and transmits the encoded message to a base station (see col. 2, lines 46-56). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the above reference with the teaching of Martinez for the advantage of maximizing the efficiency of the available bandwidth and throughput (see col. 2, lines 34-35).

Allowable Subject Matter

Claims 6, 13-15, 17-22 and 24 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meless N Zewdu whose telephone number is (703) 306-5418. The examiner can normally be reached on 8:30 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (703) 308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Meless Zewdu
Examiner

M. Z.


WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

23 April 2004.